The Value of Fit Information in Online Retail: Evidence from a Randomized Field Experiment

Brick-and-mortar and online retail channels differ in how they accomplish the two most fundamental channel functions: delivering information and fulfilling transactions (Bell et al. 2014). For apparel retailers, the traditional brick-and-mortar channel provides customers with the opportunity to physically inspect the products and assess fit information in physical stores where transactions are fulfilled as well. In contrast, the online channel typically provides product information through the web and transactions are fulfilled via direct-to-customer delivery from a centralized distribution center. The lack of physical access to inspect products prior to purchase generates friction when selling products with non-digital attributes, such as apparel (Lal and Sarvary 1999). Customers may be reluctant to purchase products they have not been able to try on and those customers who do purchase may return products when they do not fit as expected.

The increasing importance of the online channel is redrawing the competitive landscape in retail. These changes are having a profound impact on retailers’ supply chains, which originally were designed to deliver products to stores and have to be adapted to a scenario where a large fraction of the sales is delivered direct to customer. Companies also have to deal with an increasing number of returns they often are not well equipped to handle, with substantial costs in shipping, handling, and liquidation (Tang 2016). Online retailers differ in how they are trying to mitigate the challenge of not being able to provide customers with physical access to the products prior to making a purchase. Companies face a trade-off between the quality of the information they provide to their customers and the fulfillment costs they experience.

This paper focuses on virtual fitting rooms, an innovation that tries to overcome the information gap that online customers suffer. A virtual fitting room is the online equivalent of the in-store changing room. It enables customers to see how clothes look on them and check different sizes
and styles but virtually, rather than physically. This technology is now available from an increasing number of companies that have developed proprietary solutions, including Fits.me, Metail, Virtusize and Shoefitr. A growing number of prominent apparel retailers—QVC, Nordstrom, and Amazon, among many others—are offering this technology in their online stores.

The objective of this paper is to study the impact of virtual fitting-room technologies on demand and fulfillment costs. We do that by collaborating with Metail, one of the pioneering companies in the virtual fitting-room space. Previous work has explored the issue of product uncertainty in e-commerce (Hong and Pavlou 2014, Kim and Krishnan 2015). However, that work has focused on observational data and is subject to potential endogeneity issues that are hard to assess. Our partnership with Metail enables us to run a series of randomized field experiments where the availability of the virtual fitting technology is randomly assigned to a fraction of the users visiting the site of a retailer that has adopted the technology. This allows us to measure the causal effect of offering fit information.

We hypothesize that the availability of virtual fit information will result in higher conversion rates and order values and lower fulfillment costs that arise from a reduction of returns and home try-on behavior (customers ordering multiple sizes of the same product to assess fit in their homes).

We conduct two large-scale randomized field experiments to test these hypotheses. Randomized field experiments have received a lot of attention recently in the economics and business literature because they provide a very clean way to identify causal effects, overcoming issues related to confounding factors that may result in bias in observational studies.

Our approach allows us to establish that the availability of virtual fit information increases demand and reduces fulfillment costs. On the demand side, customers in the condition that had access to the tool were more likely to place an order. For customers who placed an order, those who had
access to the tool had higher order value, with orders containing on average more items and more expensive products. The virtual fitting tool is particularly effective at encouraging sales of the most expensive products.

On the cost side, we find that the availability of virtual fit information decreases fulfillment costs. We observe this through a reduction in returns and a reduction in home try-on behavior for customers who have access to the virtual fitting tool. This implies that providing virtual fit information can reduce the pressure that online channel growth is putting on retail supply chains.

We explore mechanisms through which providing virtual fit information helps both customers and retailers. We argue that the virtual fitting tool creates spillovers even to products that are not available for virtual try-on, increases loyalty, helps customers better parse their choice sets, and reduces uncertainty by providing size recommendation.

To the best of our knowledge, this is the first study proposing a large-scale randomized field experiment to analyze the impact of fit information on operational metrics in online retail. Our results have important implications for retailers operating online channels. Offering richer information about fit can increase sales and customer engagement and reduce the fulfillment costs incurred by the supply chain even when serving online customers.

References:


